
CALIBRATION INSTRUCTIONS FOR TC CO2 UNITS:
FIELD CO2 SENSOR REPLACEMENT
FOR THE
314, 460, 490 AND 397 SERIES
THERMAL CONDUCTIVITY (TC) CO2 INCUBATORS.

IMPORTANT NOTE: DO NOT ADJUST ANY POTENTIOMETER OTHER THAN SPECIFIED HERE!
-----> FAILURE TO COMPLY WILL DRASTICALLY ALTER CALIBRATION WILL WARRANTY!

Tools needed to perform this calibration:

- Standard tuning tool for potentiometers (or jewelers tool)
- Fyrite CO2 analyzer

****NOTES**** - These instructions assume that the new sensor block *has been installed and wired*.
- This calibration procedure includes a four-hour waiting period for chamber equilibration.
- The cover to the unit must remain off to allow access to potentiometers during calibration.
- Locate and familiarize yourself with the **CO2 ZERO** and **CO SPAN** pots on the PCB beforehand. Be aware of the **live AC** section on the board also... take all precautions.

- 1.) Making sure that the inside components are back in place and secure, set the incubator temperature setpoint to users desired temp (usually 37.0 C).
Set the CO2 setpoint to 0.0%. There must be NO CO2 inside the chamber at this time.
- 2.) If the user is going to use R.H., make sure there is plenty of water inside the chamber now. As a rule, we ALWAYS recommend R.H. in the chamber for the best CO2 stability, and **as much square area** as possible for fastest recovery times..
- 3.) Use the "SCAN/HOLD" push-button switch to HOLD the CO2 reading. The LED readout should be locked onto CO2 now.
- 4.) **CENTERING THE SOFTWARE ZERO:**
Press "CAL" then "CO2" keys in sequence. *Note* the decimal point(s) displayed:
 - If only the normal decimal point (ie. 5.0) is lit, continue on to step 5 now.
 - If ALL FOUR decimal points are lit (ie. .5.0.), press the "UP" button until JUST the normal decimal point is displayed. Release key and wait 5 seconds for the beep. Go to step 5.
 - If the RIGHT TWO decimal points are lit, (ie. 5.0.), press the "DOWN" button until JUST the normal decimal point is displayed. Release key and wait 5 seconds for the beep. Go to step 5.
- 5.) **** MOST IMPORTANT**** You MUST allow at least four hours from this point for the chamber to equilibrate both temperature and R.H.

6.) **ZEROING:**

Now that at least 4 hours have passed, rotate pot "**CO2 ZERO**" until an LED reading of 0.0 or 0.1% CO2 is present. Let stand a few minutes, at which time verify that the reading is still 0.0 or 0.1%. If not, readjust pot "**CO2 ZERO**" and repeat check.

7.) Adjust the CO2 setpoint to what the user will be using (usually 5-7% CO2). Allow the CO2 to reach setpoint and hold for a couple of minutes.

8.) **SPANNING:**

Perform a Fyrite check of the chamber CO2 content. Careful attention to proper sampling is critical at this point. If any doubt exists about the actual CO2 concentration, re-sample to verify.

9.) Locate pot "**CO2 SPAN**" on the PCB. Calculate a value corresponding to 1/2 the difference between the Fyrite value and the readout value. Rotate the **SPAN** pot until this calculated value appears on the incubator display.

* **EXAMPLE 1:** Incubator readout = 7.0% CO2

Fyrite indication = 5.0% CO2

Reading difference = $(7.0 - 5.0) = 2.0 \%$

1/2 difference (midway point) = 6.0% <-----

therefore, rotate the **SPAN** pot until the incubator display indicates 6.0% CO2.

* **EXAMPLE 2:** Incubator readout = 4.0% CO2

Fyrite indication = 3.0% CO2

Reading difference = $(4.0 - 3.0) = 1.0 \%$

1/2 difference (midway point) = 3.5% <-----

therefore, rotate the **SPAN** pot until the incubator indicates 3.5% CO2.

10.) Allow time for the incubator to once again recover to CO2 setpoint and equilibrate. Perform another Fyrite check of the chamber CO2 content. If at this time there is still a difference between the Fyrite reading and the CO2 display, go back to step 9 and again calibrate the **SPAN** pot for 1/2 the new difference. Re-verify for accuracy. (Typically, calibration should not require more than two or three "passes" through steps 9 and 10.)

11.) At this time the LED readout and Fyrite readings agree. Replace the cover of the incubator, you are finished!